REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier. The disclosure of Applicant's application provides support for the amendments to the claims. For example, at least page 14, line 20, to page 16, line 1, of Applicant's specification provide support for the amendments to the claims.

After amending the claims as set forth above, claims 1 and 6-11 are now pending in this application.

Rejections under 35 U.S.C. § 103

Claims 1, 10, and 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pub. No. 2003/0235730 to Noetzel *et al.* (hereafter "Noetzel") in view of U.S. Pub. No. 2002/0192519 to Fujita *et al.* (hereafter "Fujita") and U.S. Pub. No. 2002/0051899 to Keskula *et al.* (hereafter "Keskula"). This rejection is respectfully traversed.

Amended claim 1 recites a control device of a vehicular fuel cell system comprising, among other things, a warm-up output control section and a run permission section, wherein the run permission section is configured to provide the vehicle with the run permission (1) when the voltage value of the fuel cell stack is equal to or more than a run available voltage value that is necessary before the vehicle may commence travel, wherein the run available voltage value is obtained from predetermined current/voltage characteristics showing a relationship between the electric current value of the fuel cell stack and the run available voltage value at a temperature at which an output value of the fuel cell stack is available to provide the vehicle with the run permission, or (2) when the electric current value of the fuel cell stack is equal to or less than a run available current value that is necessary before the vehicle may commence travel, wherein the run available current value is obtained from predetermined current/voltage characteristics showing a relationship between the voltage

value of the fuel cell stack and the run available current value at a temperature at which the output value of the fuel cell stack is available to provide the vehicle with the run permission. Amended claims 10 and 11 include similar language.

Applicant has discovered that because current/voltage characteristics vary with temperature, a stack output value at which a vehicle can commence travel cannot be obtained at a low temperature, such as at points A, A' in the example shown in Figure 7 of Applicant's application. However, it is difficult to monitor a temperature of a fuel cell and determine whether the temperature has increased sufficiently to permit travel of a vehicle, such as at points B, B' in the example of Figure 7 of Applicant's application, particularly since the temperature of a fuel cell stack varies greatly during a start up of the fuel cell stack. Further, if a constant power control is utilized, a voltage value for a run permission may correspond to only a single value. However, if power control is considered in view of power required by auxiliary equipment, a voltage value for a run permission can vary in dependence on the respective power control quantities. Applicant's invention advantageously enables a time needed before making a judgment to determine whether warm-up has been completed to be minimized and the energy for the warm-up to be saved, thereby improving fuel performance of a fuel cell powered vehicle, and correctly determining whether consideration of power required by auxiliary equipment is carried out.

Noetzel discloses an apparatus for controlling a fuel cell system in which a power switching device selectively connects and disconnects a fuel cell voltage to at least one load, depending at least in part on an operating fuel cell stack temperature, fuel cell voltage, and fuel cell current. See Noetzel at paragraph 0010.

However, Noetzel does not disclose or suggest a control device in which a run permission section is configured to provide a vehicle with a run permission (1) when the voltage value of the fuel cell stack is equal to or more than a run available voltage value that is necessary before the vehicle may commence travel, wherein the run available voltage value is obtained from predetermined current/voltage characteristics showing a relationship between the electric current value of the fuel cell stack and the run available voltage value at a temperature at which an output value of the fuel cell stack is available to provide the vehicle

with the run permission, or (2) when the electric current value of the fuel cell stack is equal to or less than a run available current value that is necessary before the vehicle may commence travel, wherein the run available current value is obtained from predetermined current/voltage characteristics showing a relationship between the voltage value of the fuel cell stack and the run available current value at a temperature at which the output value of the fuel cell stack is available to provide the vehicle with the run permission, as recited in claims 1, 10, and 11.

The device of Noetzel includes a mode controller 28 that monitors values of I_{STACK} and V_{STACK}. See Noetzel at paragraphs 0029-0032. However, Noetzel does not disclose or suggest the concept of providing a run permission to a vehicle at a temperature via a run permission section, as recited in claims 1, 10, and 11.

Noetzel only discloses determining whether a start-up value of I_{STACK} is greater than a predetermined threshold. See Noetzel at paragraphs 0028-0032. Noetzel does not disclose or suggest that the predetermined threshold is a run available current value obtained from predetermined current/voltage characteristics showing a relationship between a voltage value of a fuel cell stack and the run available current value, as recited in claims 1, 10, and 11. Noetzel is silent in regard to the nature of the predetermined threshold, which appears to be a predetermined number. In addition, Noetzel does not disclose or suggest comparing a voltage value of a fuel cell stack to a run available voltage value obtained from predetermined current/voltage characteristics showing a relationship between a current value of the fuel cell stack and the run available voltage value, as recited in claims 1, 10, and 11. Further, the power switching device 42 of Noetzel only selectively connects and disconnects a fuel cell voltage to at least one load and since auxiliary equipments are not operated during start up of the system of Noetzel, the system of Noetzel is not concerned with a required power by auxiliary equipment or characteristics necessary for a run permission, as recited in claims 1, 10, and 11.

Fujita discloses a power control unit 700 that calculates a voltage-current characteristics map of a fuel cell 200 from an output voltage V and an output electric current I detected by sensors. See Fujita at paragraphs 0173 and 0174. The power control unit 700

then calculates an output electric current Io and a maximum power Qmx. See Fujita at paragraph 0173.

Keskula discloses a method of monitoring a fuel cell stack in which the voltage and current of a fuel cell stack are monitored and that a fuel cell stack can be characterized by a voltage at a given current or, conversely, as a current at a given voltage via a polarization curve. See Keskula at paragraphs 0027-0029.

The Office argues on pages 4-5 and 9-11 of the Office Action that Fujita and Keskula remedy the deficiencies of Noetzel. In particular, the Office argues that Fujita discloses voltage-current characteristic maps and that output voltage or current can be determined from a run available electric current or voltage, and that Keskula discloses characterizing a fuel cell stack by a voltage at a given current or vice versa. Applicant respectfully disagrees.

Fujita and Keskula do not remedy the deficiencies of Noetzel because these references also do not demonstrate that it is known in the art to provide a vehicle with a run permission (1) when the voltage value of the fuel cell stack is equal to or more than a run available voltage value that is necessary before the vehicle may commence travel, wherein the run available voltage value is obtained from predetermined current/voltage characteristics showing a relationship between the electric current value of the fuel cell stack and the run available voltage value at a temperature at which an output value of the fuel cell stack is available to provide the vehicle with the run permission, or (2) when the electric current value of the fuel cell stack is equal to or less than a run available current value that is necessary before the vehicle may commence travel, wherein the run available current value is obtained from predetermined current/voltage characteristics showing a relationship between the voltage value of the fuel cell stack and the run available current value at a temperature at which the output value of the fuel cell stack is available to provide the vehicle with the run permission, as recited in claims 1, 10, and 11.

The voltage-current characteristics map calculated by the device of Fujita are used to calculate an output electric current and a maximum power, not a run available voltage value or a run available current value obtained from predetermined current/voltage characteristics

showing a relationship between a current or voltage value of the fuel cell stack and the run available voltage or current at a temperature at which the output value of the fuel cell stack is available to provide the vehicle with the run permission, as recited in claims 1, 10, and 11.

Keskula discloses monitoring the voltage and current of a fuel cell stack and characterizing the stack by a voltage at a given current or a current at a given voltage via a polarization curve, but does not disclose or suggest obtaining a run available voltage value or a run available current value from predetermined current/voltage characteristics showing a relationship between a current or voltage value of the fuel cell stack and the run available voltage or current at a temperature at which the output value of the fuel cell stack is available to provide the vehicle with the run permission, as recited in claims 1, 10, and 11.

Like Noetzel, Fujita and Keskula are silent in regard to this concept of providing a run permission using a run available voltage value or a run available current value obtained from predetermined current/voltage characteristics showing a relationship between a current or voltage value of the fuel cell stack and the run available voltage or current at a temperature at which the output value of the fuel cell stack is available to provide the vehicle with the run permission, as recited in claims 1, 10, and 11. Fujita and Keskula provide no guidance or suggestion to one of ordinary skill in the art to modify the device of Noetzel to use a voltage-current characteristics map calculated by the device of Fujita to determine a run available voltage value or run available current value or to use the polarization curves of Keskula to determine a run available voltage value or run available current value at a temperature at which an output value of the fuel cell stack is available to provide the vehicle with the run permission, as recited in claims 1, 10, and 11.

As a result, the combination of Noetzel, Fujita, and Keskula does not provide all of the features of claims 1, 10, and 11 because the combination of Noetzel, Fujita, and Keskula does not disclose or suggest obtaining a run available voltage value or a run available current value obtained from predetermined current/voltage characteristics showing a relationship between a current or voltage value of the fuel cell stack and the run available voltage or current at a temperature at which the output value of the fuel cell stack is available to provide the vehicle with the run permission and providing a run permission by comparing a fuel cell

stack voltage value or current value to the run available voltage value or run available current value, as recited in claims 1, 10, and 11.

In addition, Fujita and Keskula do not disclose or suggest providing a vehicle with a run permission when the voltage value of the fuel cell stack is equal to or more than such an obtained run available voltage or when the current value of the fuel cell stack is equal to or less than the obtained run available current value, as recited in claims 1, 10, and 11, because these references do not discuss obtaining a run available voltage or current value or comparing a fuel cell stack current or voltage to such values.

For at least the reasons discussed above, the combination of Noetzel, Fujita, and Keskula does not render claims 1, 10, and 11 to be unpatentable because the combination of Noetzel, Fujita, and Keskula do not disclose or suggest all of the features of claims 1, 10, and 11. Reconsideration and withdrawal of this rejection is respectfully requested.

Claim 6 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Noetzel, Fujita, and Keskula in view of JP 2002-134150 to Ito (hereafter "Ito"). This rejection is respectfully traversed. Ito fails to remedy the deficiencies of Noetzel, Fujita, and Keskula discussed above in regard to independent claim 1, from which claim 6 depends. Reconsideration and withdrawal of this rejection is respectfully requested.

Claims 7 and 8 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Noetzel, Fujita, and Keskula in view of U.S. Pub. No. 2004/005487 to Matoba (hereafter "Matoba"). This rejection is respectfully traversed. Matoba fails to remedy the deficiencies of Noetzel, Fujita, and Keskula discussed above in regard to independent claim 1, from which claims 7 and 8 depend. Reconsideration and withdrawal of this rejection is respectfully requested.

Claim 9 is rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Noetzel, Fujita, and Keskula in view of U.S. Pub. No. 2003/0134239 to Beutel *et al.* (hereafter "Beutel"). This rejection is respectfully traversed. Beutel fails to remedy the deficiencies of Noetzel, Fujita, and Keskula discussed above in regard to independent claim

1, from which claim 9 depends. Reconsideration and withdrawal of this rejection is respectfully requested.

Conclusion

Applicant submits that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing or a credit card payment form being unsigned, providing incorrect information resulting in a rejected credit card transaction, or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date September 20, 2010

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